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In the Matter of Application by BellSouth Corporation, BellSouth Telecommunications, Inc., and BellSouth Long Distance, Inc., for Provision of In-Region, InterLATA Services in Louisiana	CC Docket No. 98-121

To: The Commission

REPLY BRIEF IN SUPPORT OF
SECOND APPLICATION BY
BELLSOUTH FOR PROVISION OF IN-REGION,
INTERLATA SERVICES IN LOUISIANA

APPENDIX

BELLSOUTH
SECOND LOUISIANA APPLICATION § 271 REPLY

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APPENDIX
TABLE OF CONTENTS

19 Reply Affidavit of Richard L. Schmalensee (originally filed in Docket No. 97-208) (Nov. 14, 1997)

20 Reply Affidavit of Professor Jerry A. Hausman (originally filed in Docket No. 97-231) (Dec. 18, 1997)

Reply Affidavit of Aniruddha Banerjee, Ph.D.
on Behalf of BellSouth Corporation
CC Docket No. 98-121
August 28, 1998

I. Introduction and Purpose

1. I am Aniruddha Banerjee, a Senior Consultant at the National Economic Research Associates, Inc., in Cambridge, Massachusetts. I filed an affidavit on July 9, 1998, on behalf of BellSouth Corporation in the present docket.[1] Attached to that affidavit was a study called *Competitive Analysis of PCS Offerings in the New Orleans Major Metropolitan Area*, in which I analyzed the likely impacts of PCS service plans offered by Sprint PCS and PrimeCo on BellSouth's local customers in the New Orleans major metropolitan area. I also filed a similar affidavit on November 6, 1997, and a reply affidavit on December 19, 1997, on behalf of BellSouth Corporation in CC Docket 97-231.[2]

2. Professor Carl Shapiro and Dr. John Hayes[3] and Sprint[4] (relying on the Shapiro-Hayes analysis) have raised several objections to the analysis contained in my 1998 affidavit.[5] Separately, Professors R. Glenn Hubbard and William H. Lehr[6] have critiqued certain aspects of that analysis on behalf of AT&T. The purpose of this reply affidavit is to correct several misconceptions and errors that underlie those objections and to provide additional insight into my analysis. The specific issues to which I respond are as follows.

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[1] *In the Matter of Application by BellSouth Corporation, BellSouth Telecommunications, Inc. for Provision of In-Region, InterLATA Services in Louisiana*, CC Docket 98-121 ("1998 Affidavit").

[2] *In the Matter of Application by BellSouth Corporation, BellSouth Telecommunications, Inc., and BellSouth Long Distance, Inc., for Provision of In-Region, InterLATA Services in Louisiana*, CC Docket 97-231 ("1997 Affidavit" and "1997 Reply Affidavit").

[3] Declaration of Carl Shapiro and John Hayes, on behalf of Sprint in this docket ("Shapiro-Hayes").

[4] Petition to Deny of Sprint Communications Company L.P. in this docket, August 4, 1998 ("Sprint").

[5] Professor Shapiro and Sprint had responded similarly to my 1997 Affidavit in CC Docket 97-231. I had, in turn, responded to their comments in my 1997 Reply Affidavit.

[6] Affidavit of R. Glenn Hubbard and William H. Lehr, on behalf of AT&T Corporation in this docket, AT&T Exhibit I, August 4, 1998 ("Hubbard-Lehr").

- Shapiro-Hayes and Hubbard-Lehr both claim that Sprint and other PCS providers are competing only with analog *cellular service*, not with traditional wireline service.[7] The implication is that *consumers* cannot possibly regard PCS as a substitute for BellSouth's wireline service. Shapiro-Hayes and Hubbard-Lehr also assert that PCS does not yet provide meaningful or viable competition for wireline service. The implication is that without substantial loss of market share to PCS providers, wireline service providers like BellSouth cannot yet claim to be facing local facilities-based competition. Relatedly, both Shapiro-Hayes and Hubbard-Lehr rely on an April 1997 report in the trade press to argue that PCS growth and buildout will likely be too slow to pose any threat to existing wireline networks until some unforeseeable future time. The implication is that the PCS industry does not now, and will not anytime soon, have the scope or ubiquity to really compete for wireline customers.

- Shapiro-Hayes and Hubbard-Lehr both claim that PCS prices remain well above wireline local exchange prices for most Louisiana customers. The implication is that PCS does not yet pose a price-based threat to BellSouth's wireline service in Louisiana.

- Shapiro-Hayes and Hubbard-Lehr both fault my analysis for having compared the cost of a bundle of local and intraLATA toll minutes and five vertical services (or "features") under BellSouth's wireline prices with that under current PCS rate plans offered by Sprint PCS and PrimeCo in Louisiana.[8] The implication is that the cost comparisons conducted in my 1998 affidavit biased upward the probability of switching from BellSouth's wireline service to PCS service. Both Shapiro-Hayes and Hubbard-Lehr find that my analysis exaggerates the actual percentage of customers who match the profile of usage that would be less expensive under any of the PCS plans than under BellSouth's current wireline service plans. The implication is that were those percentages to be "corrected" along the lines suggested by Shapiro-Hayes and Hubbard-Lehr, the competitive threat to BellSouth's wireline service from current PCS plans would be minimal.

[7] Hubbard-Lehr echo the view expressed by AT&T witness Jordan Roderick that PCS is not presently *marketed* as a competitive alternative to wireline service. See *Affidavit of Jordan Roderick*, AT&T Exhibit N, on behalf of AT&T Corporation in this docket, filed August 4, 1998. Mr. Jordan, however, predicts that at some point PCS could become a substitute for wireline service:

> To be sure, it is very much AT&T's hope and expectation that at some point in the future, as technology develops, digital wireless service will become an attractive substitute for wireline local exchange service for a wide array of customers. Indeed, AT&T is *investing hundreds of millions of dollars* in an effort to develop such technology and make its wireless services—both fixed and mobile—an *attractive widespread competitive alternative* to traditional wireline service. (Jordan Affidavit, at 4, emphasis added)

[8] Note that PCS service does not differentiate between local and intraLATA toll minutes (as does wireline service). Instead, all calls made within a PCS provider's designated coverage area are assessed at the same, fixed rate. In reality, those coverage areas are frequently large enough that some calls made between destinations within them would, for a wireline service provider, be regarded as intraLATA, rather than local, calls.

- Shapiro-Hayes claim that based on my data "the average consumer" in New Orleans has over 2000 minutes of local and intraLATA usage each month. The implication is that because that so-called average consumer has too much usage for PCS to be cheaper than wireline, it is of no real consequence whether another (non-average) segment of customers could indeed find PCS to be more economical than wireline service.

- Shapiro-Hayes contend that exclusion of *inter*LATA toll minutes from the price comparisons in my analysis understates actual PCS prices to the consumer. The implication is that the addition of interLATA toll minutes will make PCS much less competitive with wireline service, even though that addition of interLATA toll minutes would make wireline calling more expensive as well.

3. This reply affidavit demonstrates that the implications drawn above are erroneous and, therefore, the claims and arguments by Shapiro-Hayes and Hubbard-Lehr summarized above are themselves untenable.

II. SUMMARY OF CONCLUSIONS

4. My reply affidavit establishes the following:

1. My 1998 affidavit correctly demonstrated that for a non-trivial segment of consumers and *on a price basis alone*, PCS offerings in Louisiana are feasible substitutes for a *comparable* package of wireline local and intraLATA toll services offered by BellSouth. That conclusion remains true even after the adjustments to the estimates made in this reply affidavit. The rapid drop in PCS prices since I first analyzed PCS pricing plans for my 1997 affidavit (between 5 and 40 percent for different usage levels in the last 12-18 months, depending on the provider and the pricing plan) only reinforces that belief. At the same time, as evidenced by rapid growth in BellSouth's own sales of vertical features, the five features available from PCS providers at zero incremental cost have greatly enhanced the *value* of PCS service and made it increasingly competitive with wireline service.

2. My cost comparison methodology for calculating switching probabilities remains sound despite objections from Shapiro-Hayes and Hubbard-Lehr. While I do *not* believe that *all* residential wireline customers (or even those with low local and intraLATA toll usage among them) will take all five of the vertical features offered by PCS providers, an apples-to-apples price comparison is necessary to determine just how much the same set of services would cost under different pricing plans. One can reasonably conclude that at least for that set of consumers who may wish to subscribe to the bundled set of services available under the PCS option, there *is* a range of usage over which the PCS plan dominates the residential wireless pricing plans. Accepting a specific suggestion by Shapiro-Lehr and Hubbard-Lehr to adjust my estimates of the

switching probabilities, I still find that those probabilities are up to 9 percent for some of Sprint PCS and PrimeCo plans. Alternative estimates of switching probabilities presented by Shapiro-Hayes and Hubbard-Lehr are based on erroneous assumptions and incomplete analyses.

3. The "average consumer's" usage profile is irrelevant for estimating the switching probability. While Shapiro-Hayes confuse stand-alone averages with conditional averages (a distinction made necessary because tests in my 1998 affidavit showed that local and intraLATA toll minutes are not statistically independent), they make the larger error of trying to judge the probability of switching to PCS by reference to average levels of usage. As I have repeatedly stated, the group of switchers is most likely to be composed of customers with low volumes of usage, not those with average or higher levels of usage.

4. The cost of *inter*LATA toll calls should not be included in the wireline-PCS price comparisons. Shapiro-Hayes' call for inclusion of interLATA toll minutes in the price comparisons is misplaced for several reasons. Apart from the flaws in the manner in which they estimate and interpret average interLATA toll use, Shapiro-Hayes overlook several structural reasons for excluding those minutes from the price comparisons. For example, PCS coverage area boundaries do not correspond to wireline service boundaries, so that certain interLATA *wireline* calls may qualify for exemption from long distance charges when carried by PCS providers. Also, various special PCS calling plans that reduce considerably the real cost of calling long distances and the present prohibition on BellSouth's provision of wireline interLATA toll service make it necessary to exclude interLATA minutes from the price comparisons.

III. RESPONSE TO SHAPIRO-HAYES (SPRINT) AND HUBBARD-LEHR (AT&T)

A. PCS *is* a Substitute for Wireline Local Service Even if it is Marketed as an Alternative to Cellular Service

5. Shapiro-Hayes contend that (i) PCS is being provided in Louisiana in competition only to *cellular*, not wireline, service and, therefore, cannot be regarded as "an alternative to traditional wireline service" (Shapiro-Hayes, at 7) and (ii) "[f]or the vast majority of residential customers in Louisiana, PCS remains far more expensive than BellSouth's wireline local service ..." (Shapiro-Hayes, at 13) In a similar vein, Sprint attaches several New Orleans area newspaper advertisements by PCS providers purporting to show that PCS is being marketed as an alternative to cellular, not wireline service. (Sprint, Appendix A) Sprint further claims that PCS and wireline services are in distinct *markets* because (i) "recent consumer press reports and industry analyses" analyze cellular services "wholly separate and apart from" wireline

services, (ii) the technologies that provide cellular (or PCS) services and wireline services are fundamentally different, even though some of those services may have common suppliers, (iii) cellular and PCS services are "specialized for mobile use" while wireline services are not, and (iv) the FCC itself apparently believes—as expressed in a number of its orders or reports—that cellular and PCS services are in a separate market from wireline services. (Sprint, at 13-17) Hubbard-Lehr add that "... evidence that PCS is not viewed today as a substitute for wireline service (except perhaps by a small niche minority) is how it is *marketed* ... PCS providers are positioning the service as an alternative to *mobile* wireless services, not *fixed* wireless or wireline." (Hubbard-Lehr, at 42)

6. These claims imply that PCS is not a substitute, or even a *de facto* alternative, for wireline service because of the manner in which it is marketed and because the underlying technologies of PCS and wireline service are different. Not only do I disagree with this position (because how a product is *marketed* does not necessarily determine its ability to substitute for another product), but it is also an irrelevant criticism of the analysis in my 1998 affidavit. The point of my analysis was *not* to establish whether their product and geographic dimensions would argue for classifying wireline and cellular (or PCS) services in the same or different markets. Rather, it was only to determine whether a significant number of BellSouth's present customers in the New Orleans major metro area could find PCS service to be a substitute (or, more economical alternative) for wireline service *on the basis of price differences alone*. The rapid drop in PCS prices since I first analyzed PCS pricing plans for my 1997 affidavit only reinforces my belief that PCS appears increasingly to the residential consumer as a viable substitute (from the standpoint of both functionality and price) for wireline local and intraLATA toll services.

B. PCS *is* Already a Viable Alternative for Wireline Telephony

7. All parties appear to accept the possibility that PCS can be a substitute for wireline service; they just do not all believe that it is a sufficiently "close" substitute today. For example, Shapiro-Hayes state:

> We are optimistic that PCS will eventually compete with wireline service for a significant number of local exchange customers. The steadily decreasing prices,

> rapid network build-outs, and increasing penetration rates all speak to that possibility. But the fact remains that PCS does not provide meaningful competition to wireline local exchange today. (Shapiro-Hayes, at 6)

Likewise, Sprint concedes:

> Sprint is of course not suggesting here that PCS will never be able to provide a meaningful alternative to landline fixed telephone service. Through its ownership of Sprint PCS, Sprint is committed to investing the necessary capital and resources to allow PCS to realize its full economic potential. Currently, however, the unquestionably highest use of the wireless spectrum remains mobile services that are complements to, not substitutes for plain old telephone service. (Sprint, at 25)

Finally, Hubbard-Lehr assert that "... while PCS or some other wireless technology ... *may* offer a viable alternative to wireline service in the *future*, PCS is not a viable alternative *today*." (Hubbard-Lehr, at 41; emphasis in original)[9]

8. These statements do not deny the potential for PCS to be an important functional and economic substitute for wireline service. On this point, we can all agree. Where we disagree is in determining whether PCS is *already* a substitute for wireline service for some customers, even though for others it may still be a *supplementary* service. In economics, two products are considered substitutes if their cross-price elasticity of demand is *positive* and complements if that elasticity is *negative*. I am not aware of any evidence (from the FCC or other sources) that PCS and wireline services have a negative cross-price elasticity, i.e., as the price of one falls, the demand for *both* is stimulated. Perhaps, what the FCC means to say when using the term "complementary" to describe the relationship between PCS and wireline service is that both may be used by a consumer without any reference to their relative prices.[10] If that is so, then PCS is really a *supplement* for wireline service in that consumer's eyes, but it doesn't say anything about whether some degree of substitution could or could not happen as relative prices changed.[11] That one product can be simultaneously a substitute and a supplement for another is

[9] AT&T's similar position is expressed in the Jordan Affidavit. See fn. 7.

[10] For example, a 1997 FCC *Memorandum Opinion and Order* characterized mobile communications services as "largely complementary" to wireline services but also noted the potential for future wireless-wireline substitution. See Sprint, at 15, fn. 36.

[11] Indeed, Shapiro-Hayes make, in my view, a somewhat confusing use of such terminology when they state: "The

entirely possible. For example, the U.S. postal service and overnight delivery services are clearly substitutes for some customers while they may be supplements for others (e.g., for those with varying needs about the speed with which mail is delivered).[12] That "mixed" situation, however, cannot be the basis for denying *any* viable substitution.

9. The central question in this proceeding is whether, in the New Orleans major metro area *today*, some identifiable segment of consumers is already treating PCS and wireline services as feasible alternatives and, hence, as effective substitutes. BellSouth has tendered survey evidence that such an identifiable segment of consumers already exists.[13] My 1998 affidavit found that, on the basis of relative prices alone, a somewhat larger segment of consumers *could* (if they chose to) substitute PCS for wireline telephony *today*. In questioning these findings, Shapiro-Hayes and Hubbard-Lehr make it seem that whatever actual or potential demand substitutability presently exists is simply not large enough to merit serious attention. That amounts to setting a market share loss target (though not in so many words) for determining whether the label "substitutes" can be assigned to PCS and wireline services.

10. Putting aside their legal relevance to BellSouth's application, market share loss targets are notoriously backward-looking and a hopelessly lagging indicator of market trends. At a time when rapid changes are occurring on both demand and supply sides of the market (e.g., innovative new pricing plans, relaxed regulation, and bundling options), market shares (however measured) are at best a partial indicator of the direction in which the market as a whole is going. Therefore, waiting for a certain predetermined target level of market share erosion to occur before pronouncing that the products in that market are mutually competitive is like trying to catch a wave after it has dissipated. Evolving market trends and realities cannot be, and should not be, understood solely by reference to some fixed market share loss target. Furthermore, how is such a target to be set? And who should set it? When PCS and wireline

best evidence indicates, on the contrary, that PCS is currently used a *complement* to wireline service, not a substitute for it. As a *supplement* to local exchange service, PCS may generate more minutes of use ..." (Shapiro-Hayes, at 6; emphasis added)

[12] Similarly, electronic mail and telephone calling can be either alternatives or supplements for persons that need to communicate instantly with distant parties.

[13] *Declaration of William C. Denk* and *Affidavit of Bernie Pinsonat* in this docket.

pricing are converging, some consumers are replacing wireline with PCS service, and others are initiating telephone service with PCS service, should judgment about substitution between PCS and wireline be withheld until some arbitrary market share loss target has been achieved?

11. Apart from the rapid decline in PCS prices (even relative to conventional analog cellular prices), the growth of the PCS footprint and the designation of relatively large geographic areas as PCS home service or coverage areas are clear indications of the approaching ubiquity of PCS and its strong challenge (whether announced or not) to conventional wireline telephony.[14] On

[14] In fact, several key PCS players *have* articulated or hinted at just such a challenge. In a recent news release, PrimeCo touted the possibility that the U.S. is on the verge of widespread use of wireless telephony:

> So what's the breakthrough needed to reach critical mass in the wireless industry? According to industry analysts, it's a compelling wireless-to-wireline price ratio. Consumers have demonstrated their willingness to pay a premium for mobility. In fact, subscribers to old-fashioned cellular service have been shelling out anywhere from 4 to 6 times what they pay per minute for long distance service for the convenience of wireless service ... In 1996, the wireless-to-wireline premium even in big cities like New York and Los Angeles was about 13 to 1. In other words, 500 minutes of use on a wireless phone cost about 13 times more than 500 minutes of use on a wireline phone. But by the end of 1997, just one year after the advent of PCS, the wireless-to-wireline premium in these cities fell to about 6 to 1. ... Industry forecasters project a 4 to 1 premium could trigger *mass consumer acceptance of wireless phones as a day-to-day communications tool* instead of a luxury item or a safety device ... (http://news.primeco.com/primeco-site/pages/whats_new/pcs.htm; emphasis added).

Simple mathematics demonstrates why today's PCS prices in New Orleans already do as well, if not better than, the 4 to 1 premium at which PrimeCo would expect "mass acceptance" of PCS. Assume a customer only has 250 minutes of *local* calling every month. Under BellSouth's flat-rated local service plan, the monthly cost would be $17.14 (inclusive of other line charges) and, if five features were to be added, $30.44. Ignoring the features for the moment (even though PCS service includes five features), the 4 to 1 premium point would call for PCS cost to be in the neighborhood of $69 a month. Assuming that the customer's 250 outgoing local minutes are roughly equivalent to 500 outgoing and incoming ("O&I") local minutes, the PCS cost of 500 such minutes under Sprint PCS Plan 4 is $69.99 and PrimeCo's is only slightly higher at $74.99 (Digital Choice 500 Plan). The 4 to 1 premium is, for all practical purposes, realized. Next, at the other extreme, assume the customer's 250 outgoing minutes are all *intraLATA toll*. Under BellSouth's current wireline plans, the cheapest monthly cost to the customer would be $35.50 (Area Plus plan plus line charges, again ignoring features). The 4 to 1 premium would then be $142 per month. Again, assuming 500 O&I intraLATA toll minutes, Sprint PCS Plans 3, 4, and 5 (ranging in monthly cost from $58.99 to $99.99) and PrimeCo's Plans 3, 4, and 5 (ranging in monthly cost from $56.49 to $119.99) would all be within the premium. While these examples are extreme and hypothetical, they demonstrate that for a certain realistic range of usage (particularly, local usage), the 4 to 1 premium placed on non-price factors already make several PCS plans more attractive than BellSouth's wireline plans. As Table 7 of my 1998 affidavit showed, approximately a quarter of wireline customers make 250 or less outgoing minutes of local calls a month.

Other PCS carriers are adopting flat-rates service plans that mirror existing wireline rates. The latest example is Century Telephone Enterprises which serves the Grand Rapids, Michigan, area with a combination of TDMA-based PCS and cellular service. A recent article notes that "... CenturyTel's PCS service has been priced at rates similar to wireline voice service in "home-zone" coverage areas ... Industry analysts report that for the wireless-only segment to grow, cellular carriers will have to do as CenturyTel is doing—offer services *at rates* the latter point—the fast-track development of PCS—AT&T and Sprint appear to send out mixed signals. Hubbard-Lehr (at 42, fn. 64) cite a trade press report from April 1997—about 16 months ago, a very long time in the PCS industry[15]—that PCS network development and rollouts have been slowed for a number of cost and technological reasons. Yet, AT&T (Jordan Affidavit, at 4) acknowledges that AT&T is "investing hundreds of millions of dollars in an effort to develop [digital wireless or PCS] technology and make its wireless services—*both fixed and mobile*—an attractive widespread competitive alternative to traditional wireline service."[16] Similarly, Shapiro-Hayes (at 13) rely on the same trade press report as Hubbard-Lehr to opine: "... there remains considerable uncertainty over whether PCS will ever grow to be a significant threat to wireline local exchange services." Yet, Sprint (Sprint, at 25) acknowledges that "[t]hrough its ownership of Sprint PCS, Sprint is committed to investing the necessary capital and resources to allow PCS to realize its full economic potential." Regardless of what their economists say, both AT&T and Sprint evince a keen interest in developing *national* footprints for their respective PCS networks.[17]

12. Shapiro-Hayes contend that:

> ... much of the preliminary evidence of wireline substitution pertains to second and third lines ... Second and third lines are a limited segment of the overall local exchange market, accounting for about 13 percent of the 16.2 million residential access lines in BellSouth's region. Because BellSouth would likely retain monopoly power in the overall market even if it faced significant competition for second and third lines, even convincing evidence of competition

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comparable to local landline rates." "Landline Displacement Eyed by CenturyTel in PCS/Cellular Offering," *Wireless Today*, August 12, 1998. (emphasis added)

[15] Examples abound of rapid growth in PCS subscribership and buildout in a relatively short time span. PrimeCo, which operates in 11 Major Trading Areas in 19 states, claimed nearly 600,000 subscribers by mid-1998 after having begun service only in November 1996. Over a third of those subscribers signed on in the first six months of 1998 itself. See http://news.primeco.com. Powertel, which recently received the 1997 *Wireless Week* PCS Carrier Excellence Award, has gained over 200,000 subscribers in only 22 months. See http://www.powertel.com/pressrel_index.html.

[16] Emphasis added.

[17] In order to do so, Sprint PCS—which now claims to be serving over "4,000 cities and communities across the country" has followed a strategy of affiliating with smaller regional PCS providers on the CDMA standard currently offering service in various states. Source: http://www.sprintpcs.com/News/releases/98_07_29.html. Even PrimeCo has developed an affiliates-based program to offer near-ubiquitous roaming to its PCS customers (in 45 out of the top 50 markets, covering 90 percent of the U.S. population). Source: http://news.primeco.com.

> in this market segment would not be sufficient to conclude that PCS is a close competitor to wireline services. (Shapiro-Hayes, at 12; footnotes omitted)

This contention has two major problems. First, it is misleading to characterize PCS competition as a form of competition for a customer's second or third line. It is a fact that wireline service became subscribed to nearly universally long before the advent of wireless or PCS service. Therefore, an existing wireline customer's decision to subscribe to both PCS and his wireline service will almost always involve additional or supplemental telephones. The sequence in which lines are added is irrelevant. In fact, the more relevant question is: what uses are "first" and "additional" lines put to? Consider a customer (currently receiving wireline service over a single line) who realizes a need for a separate line to handle data transmission (e.g., fax machine, internet). Because a wireline phone may still be the best way to handle such a need, the customer may decide to retain wireline service but to migrate all *voice* communications to PCS service. The "first" line in this situation would now provide PCS telephony and the "additional" line would remain wireline and only be used to receive and send data. Implicit in this arrangement would be the customer's preference of PCS over wireline service for all voice communications (including local and long distance) and vertical, messaging, and other enhanced services. Moreover, Shapiro-Hayes' estimate that additional lines constitute 13 percent of all access lines served by BellSouth says nothing about the percentage of customers that may have chosen to add PCS phones, rather than fixed wirelines, to their portfolio. That is, Shapiro-Hayes' 13 percent does not represent the size of the "additional" line segment (as BellSouth's survey evidence demonstrates).[18]

13. Second, Shapiro-Hayes imply some form of market share loss target when they claim that even competition for additional lines may not suffice because BellSouth would likely remain a monopoly in the "overall market." Apart from both the arbitrariness and inadequacy of any market share loss target (for reasons explained above) and whether Section 271 of the Telecommunications Act of 1996 calls for such a target, the Shapiro-Hayes claim that BellSouth's "monopoly power" would continue indefinitely is nothing short of hyperbolic.

[18] *Declaration of William C. Denk* in this docket. Mr. Denk reports that 45 percent of the PCS user sample reported wanting a mobile option in addition to wireline service and 5 percent of that sample added PCS instead of a second wireline.

Economists define monopoly by the absence of *any* competition, "big" or "small." Without a clear definition of that "overall market," the Shapiro-Hayes claim does *not* rise above a mere cliché.

C. PCS Prices *Are* Already Competitive With Wireline Prices for a Particular Customer Segment

14. The unspoken litmus test of a market share loss target clearly underlies claims by both Shapiro-Hayes and Hubbard-Lehr that PCS prices do not yet pose a competitive threat to BellSouth's wireline service for the vast majority of consumers in Louisiana. For reasons I have explained, it does not matter that a large percentage of consumers in Louisiana (more precisely, New Orleans) has yet to switch exclusively to PCS service. My 1998 affidavit showed that some of Sprint PCS and PrimeCo's service plans are already price-competitive with BellSouth's wireline service in the New Orleans major metro area for at least an identifiable segment of current wireline users. That analysis did *not* attempt to measure an actual market share shift, a demonstration that is demanded (mistakenly, in my opinion) by Shapiro-Hayes and Hubbard-Lehr. As I stressed in my 1998 affidavit, several non-price factors (including mobility, portability, and one-stop-shopping) are also likely to shape consumer choices between wireline and PCS.[19] PrimeCo's assessment that consumers are willing to pay a premium (e.g., by accepting wireless or PCS costs up to 4 times the wireline cost of a fixed level of service) for mobility and other non-price factors reflects the belief of wireless industry insiders themselves that absolute price parity is not necessary for PCS to draw level with, or pull ahead of, wireline service.[20]

15. Some current trends regarding PCS and wireless service plans in the New Orleans major metro area are undeniable. First, PCS prices have declined significantly relative to wireline prices over the past 12-18 months. Table 1 below demonstrates that the cost of PCS service from the two providers in New Orleans fell significantly between mid-1997 and mid-1998.[21]

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[19] 1998 Affidavit, at 23.

[20] See fn. 14 *supra*.

[21] The cost of PCS use reported in Table 1 is each provider's "lowest cost" in each year. That cost is computed by

Table 1. Comparison of Cost of PCS Service in New Orleans Major Metro Area, 1997-98

	Best of Sprint PCS Plans			**Best of PrimeCo Plans**		
Minutes	**1997**	**1998**	**% Change**	**1997**	**1998**	**% Change**
0	$20.00	$16.99	15.05	$18.00	$14.99	16.72
10	$20.00	$16.99	15.05	$20.80	$18.69	10.14
20	$24.00	$18.99	20.88	$23.60	$22.39	5.13
30	$28.00	$22.99	17.89	$26.40	$24.99	5.34
40	$32.00	$26.99	15.66	$29.20	$24.99	14.42
50	$36.00	$29.99	16.69	$32.00	$24.99	21.91
60	$39.00	$29.99	23.10	$34.80	$24.99	28.19
70	$42.50	$29.99	29.44	$37.60	$24.99	33.54
80	$46.00	$29.99	34.80	$40.00	$24.99	37.53
90	$49.50	$29.99	39.41	$40.00	$24.99	37.53
100	$50.00	$29.99	40.02	$40.00	$24.99	37.53
110	$50.00	$33.49	33.02	$42.60	$28.49	33.12
120	$50.00	$36.99	26.02	$45.20	$31.99	29.23
130	$53.00	$40.49	23.60	$47.80	$35.49	25.75
140	$56.00	$43.99	21.45	$50.40	$38.99	22.64
150	$59.00	$47.49	19.51	$53.00	$42.49	19.83
160	$62.00	$49.99	19.37	$55.60	$45.99	17.28
170	$65.00	$49.99	23.09	$58.20	$49.49	14.97
180	$68.00	$49.99	26.49	$60.80	$52.99	12.85
190	$71.00	$49.99	29.59	$63.40	$56.49	10.90
200	$74.00	$49.99	32.45	$66.00	$59.99	9.11

In one year, the lowest PCS cost fell between 15 and 40 percent for Sprint PCS and between 5 and 37 percent for PrimeCo, respectively. In contrast, BellSouth's local exchange tariffs remained unchanged during that period, implying that the *relative* price of PCS in the New Orleans major metro area was substantially lower.

16. Second, by bundling five vertical features into their various pricing plans, the PCS providers have, in effect, provided those features to consumers at zero *incremental* cost. Those

pricing out each provider's various pricing plans at different levels of usage and selecting the lowest cost (from among the various plans) associated with each level of usage.

"free" features have significant market value when priced out by BellSouth's tariffs. For example, four of Sprint PCS's five features, namely, Call Waiting, Caller ID, Three-Way Calling, and Voice Mail are also offered by BellSouth. However, the combined monthly incremental cost to BellSouth's customers of those four features is currently $14.30 (after applying the $3.00 multi-feature discount for four features).[22] Regardless of their *past* usage of features, it is easy to see why for *future* usage consumers could rapidly embrace a PCS service that is both cheaper (or comparable) for calling (wireline-like) local and intraLATA toll destinations *and* offers substantial extra value on desirable features.

17. Third, continuing on this theme that *value* is often a better indicator than *price* of the appeal of a particular pricing plan or service bundle, I find myself disagreeing strongly with Shapiro-Hayes' conclusion that vertical features have a rather limited appeal to Louisiana consumers.[23] The fact is that nearly *75 percent* of BellSouth's customers take one or more vertical features. This extraordinary level of interest in features beyond simply making local or intraLATA toll calls demonstrates the utility they provide. It must be kept in mind that those features are purchased at their tariffed prices (with a multi-feature discount, as applicable) from BellSouth. In contrast, PCS providers make five such features available at no incremental cost. It is not hard to imagine why that combination of value and interest in features make currently available PCS plans extremely appealing. Against the backdrop of recent BellSouth reports that accelerating demand for features has spurred revenue growth in recent years, the importance of features in any service bundle looms even larger in the PCS offerings as currently constructed.[24]

18. Fourth, Shapiro-Hayes attempt to downplay the competitive effects of PCS by pointing to the growth of 700,000 residential access lines in the BellSouth region during 1997. The use of

[22] Based on prices for features reported in Table 3 of my 1998 affidavit.

[23] For example, they refer to the fact that only 13.53 percent of customers in the proxy residential customer sample analyzed in my 1998 affidavit took five features. (Shapiro-Hayes, at 17, fn. 34)

[24] BellSouth reports that, in 1997, 6.8 million features were sold within its region, a 23 percent increase over 1996. Complete Choice packages alone (which offer unlimited local calling *and* bundle in all vertical features available from BellSouth) were purchased by about 2 million customers, nearly 13 percent of its customer base. The vast majority of BellSouth's revenue growth from vertical features in 1997 came from residential customers. Those revenues grew from $554 million in 1993 to $1.314 billion in 1997, an average annual growth of $190 million per year; however, the actual growth between 1996 and 1997 alone was $253 million, about 24 percent. Source: http://www.bellsouthcorp.com/investor/sourcebook97.

that *regional* statistic is meaningless when the issue is whether PCS competition is making inroads in the *New Orleans major metro area.* Moreover, since I never claimed that PCS currently has the ability—or even the potential—to totally, or even mostly, displace BellSouth's service, the Shapiro-Hayes argument is really beside the point. The question again, narrowly focused, is whether PCS and wireline price and value comparisons suggest that for at least an identifiable segment of present wireline customers, PCS represents an appealing option. All the evidence, in my opinion, points in the direction of an affirmative answer to that question. That the 4.6 percent growth rate in BellSouth's *region*—which Shapiro-Hayes cite—provides little or no insight into the effects of PCS competition is highlighted by the more relevant fact that the State of Louisiana experienced only a 3.0 percent access line growth rate (i.e., only two-thirds of the region-wide growth rate) during 1997.[25] While I hesitate to attribute this slower rate of growth entirely to PCS competition, the effect of such competition cannot be ruled out completely as the BellSouth end user survey evidence showed. Moreover, for several recent years, population shifts and other factors have caused high growth generally in the southeastern states and telephone companies of all stripes have been beneficiaries of that growth.

D. The Cost Comparison Methodology for Calculating Switching Probabilities *Is* Fundamentally Correct

19. Both Shapiro-Hayes and Hubbard-Lehr fault the analysis in my 1998 affidavit for being based on a comparison of the cost of a PCS service plan with that of a BellSouth wireline bundle containing the same (or, nearly the same) set of services as in the PCS plan. Their critique is based on the observation—which is undoubtedly correct—that most of BellSouth's current wireline residential customers subscribe to fewer than five vertical features. Therefore, they contend, any comparison of cost based on a BellSouth wireline bundle that contains the same number of features as a PCS service plan will tend to bias any estimate of the switching probability upward.

20. Since relative price alone was the basis for the analysis in my 1998 affidavit, it is extremely important to understand exactly what is being (and should be) analyzed here. A meaningful

[25] Source: BellSouth Telecommunications.

assessment of consumer choice among different pricing plans must treat only those prices as variable, and everything else as constant. Therefore, the set of services for which price comparisons are made should be the *same* between PCS and wireline options. For the purposes of my analysis, I had drawn an equivalence between a combination of local, intraLATA toll, and five vertical features available from BellSouth (the wireline provider) and the bundled PCS service (with comparable, local, toll, and vertical features) available from Sprint PCS or PrimeCo (the PCS provider). But drawing such an equivalence in no way implies that, *in fact*, all customers would buy five or more vertical features from BellSouth if they were to use wireline service. I do *not* believe that *all* residential wireline customers (or even only those with low local and intraLATA toll usage) will take all five of the vertical features that Sprint PCS, for example, offers. However, in order that the price comparison be conducted on an apples-and-apples basis, it is necessary to determine just how much the same set of services would cost under different pricing plans. Residential wireline customers who buy no or few vertical services may have no clear price reason to switch to the PCS option But, my interest is to determine whether, in fact, there are some customers who would regard PCS as an equivalent (bundled) service and would consider switching to it at current prices.

21. The primary conclusion of my analysis is that PCS is a viable option to a potentially substantial consumer segment. As I stated in my 1998 affidavit, "... the smallest PCS plans ... appear likely to induce *up to* 7 percent of [BellSouth's] residential wireline customers to switch. The next larger plan of each provider may similarly induce switching by *up to* 14-15 percent of [BellSouth's] wireline customers."[26] To the extent that some wireline customers would *never* see a need to subscribe to five or more features, the actual switching probabilities would be below the maximum potential switching probabilities reported in Table 14 of my 1998 affidavit.[27] Nevertheless, as I pointed out earlier, given the substantial increment in value from

[26] 1998 affidavit, at 1 (emphasis added)

[27] There is also an extremely important *practical* reason for computing only the maximum switching probabilities rather than probabilities associated with every actual and conceivable consumer usage profile. BellSouth currently offers 25 different vertical features. These features range significantly in price and, hence, so do the bundles formed from them. Moreover, feature bundles of different sizes are eligible for discounts that are not linked to the type or price of each individual feature. In theory, over 68,000 distinct "bundles" (of size one through five) can be formed from the 25 features. While the actual take rate for the overwhelming majority of them is likely to be negligible, computing the switching probability for each and every such combination is both

a PCS service bundle that provides five features at zero incremental cost and the recent rapid growth in demand for features (even from a wireline provider like BellSouth), it is not past demands, but rather future customer needs, that ought to inform any analysis of the true potential of PCS competition.[28]

22. Both Hubbard-Lehr and Shapiro-Hayes raise the possibility that the switching probabilities in Table 14 of my 1998 affidavit are overstated because, unlike wireline customers, PCS customers pay "both ways," i.e., for both outgoing and incoming ("O&I") minutes and, therefore, the number of combined minutes in the loci of domination for the four PCS plans analyzed in my 1998 affidavit (see Tables 4 and 5) ought to be halved before any comparison is made with the usage distribution in the BellSouth wireline customer sample. It is worth recalling that once my analysis had discovered specific usage combinations (of local and intraLATA toll minutes) with a set of five features which were less costly under one or the other PCS plan than under BellSouth's prevailing tariff prices, I proceeded to identify the percentage of BellSouth wireline residential customers that had a matching usage profile. Therefore, Hubbard-Lehr and Shapiro-Hayes contend that if the BellSouth usage distribution comprises outgoing-only minutes, then the aforementioned adjustment needs to be made to the minutes in the reported loci of domination. I agree that such an adjustment should be made. Following that adjustment, the estimated switching probabilities (more precisely, their upper bounds) are somewhat lower, as reported in Table 2. Even after that adjustment, however, the segment of potential switchers among BellSouth's wireline residential customers in the New Orleans major metro area remains significant.[29]

extremely tedious and of little practical value. In contrast, an upper bound to the overall switching probability—regardless of the actual bundles consumers take—makes it easier to understand just how severe the problem *could* be.

[28] I do, however, agree with Hubbard-Lehr that residential consumers "... choose their service based on expected usage ... and on other features (e.g., the reputation of the carrier or their knowledge of comparative offerings). (Hubbard-Lehr, at 45) As I had noted in my 1998 affidavit, consumer choice may be driven by several non-price factors, even though relative price may be one important determinant of that choice.

[29] Shapiro-Hayes correctly note typographical errors in Table 6 of my 1998 affidavit that make it inconsistent with Table 8 of the same affidavit. Those errors only affect the bottom half of the table, namely, that titled "Summary Statistics for BST Customers Having Positive Usage of IntraLATA Toll." A corrected version of Table 6 appears in Appendix A to this reply affidavit. Table 6 had no role in the actual calculation of the switching probabilities, and the corrections made to it do *not* alter any of the results or conclusions of the 1998 affidavit.

Table 2. Adjusted Switching Probabilities for PCS Plans			
Sprint PCS Plan	**Probability**	**PrimeCo PCS Plan**	**Probability**
Plan 1	4.46%	Plan 1	5.09%
Plan 2	8.50%	Plan 2	9.24%

23. In stating other criticisms of my analysis, Shapiro-Hayes and Hubbard-Lehr make serious errors that undermine their analysis. For example, Hubbard-Lehr refer to the fact that just over 81 percent of customers in the BellSouth sample have fewer than 10 minutes of intraLATA toll calling in a month (see Table 8 of my 1998 affidavit). This leads them to argue that two of the four PCS plans, namely, Sprint PCS Plan 2 and PrimeCo Plan 2, are "... more expensive than BellSouth's wireline service for *all* customers, regardless of local usage, once one removes intraLATA toll usage from the equation." (Hubbard-Lehr, at 48) This conclusion is without merit for two reasons.

24. First, whatever the actual intraLATA toll usage by BellSouth's wireline customers, it would be fundamentally incorrect to run my analysis on the basis solely of local minutes. PCS service is provided at the same airtime rate for all calls that originate and terminate within a PCS customer's designated coverage area. Some of those calls, if carried instead by a wireline provider like BellSouth, may be classified as local and others as intraLATA toll. Therefore, when analyzing the data, it would be improperly selective and incorrect to price out only the minutes that would be local to a wireline provider, but not the intraLATA toll minutes.

25. Second, the fact that only 19 percent of customers have more than 10 monthly minutes of intraLATA toll calling does not affect the finding that around 9 percent of customers (see Table 2 above) have the usage profile that is cheaper under either Sprint PCS Plan 2 or PrimeCo Plan 2. Interpreting all minutes in my loci of domination (Tables 4 and 5 of the 1998 affidavit) as O&I minutes, customers with, e.g., less than 23 O&I toll minutes and 109 O&I local minutes could find PrimeCo Plan 2 cheaper, or less than 22 O&I toll minutes and 95 O&I local minutes could find Sprint PCS Plan 2 cheaper. In fact, customers with a whole range of usage above 20 O&I toll minutes could find those plans cheaper than BellSouth's wireline option. Even if intraLATA toll minutes were *removed* from the equation—as Hubbard-Lehr wrongly suggest—

only customers with greater than 101 (115) O&I local minutes would find Sprint PCS Plan 2 (Prime Co Plan 2) more expensive than BellSouth's wireline service. A recomputation of Table 12 of my 1998 affidavit (on the joint distribution of local and intraLATA toll minutes) shows that this particular segment of customers comprises between 7 and 8 percent of all BellSouth wireline residential customers in the New Orleans major metro area.[30] That contradicts Hubbard-Lehr's contention that customers with no intraLATA toll usage would find PCS to be more expensive "regardless of the amount of local usage."

26. Shapiro-Hayes avoid this error and, indeed, proceed with the correct line of reasoning in estimating that roughly 4 percent of BellSouth's customers have 115 or less exclusively O&I local minutes of calling per month (although, as stated above, the actual percentage is higher). But, then they make the mistake of assuming that we need only regard customers with 115 or less O&I local-only minutes as potential switchers. Instead, if the loci of domination is interpreted correctly, it follows that customers with several *different* combinations of local and intraLATA toll usage would also qualify as being potential switchers (at least with regard to PrimeCo Plan 2). That is, not only would customers with 115 or less O&I local minutes and zero O&I intraLATA toll minutes qualify, but so also would those with, say, 110 O&I local minutes and 19 O&I toll minutes, 100 O&I local minutes and 54 O&I toll minutes, 93 O&I local minutes and 77 O&I toll minutes, and so on. The *cumulative* percentage of potential switchers with all of those different usage combinations would then surely exceed the 4 percent estimated by Shapiro-Hayes, or even the 7-8 percent estimated from the recomputed joint distribution.[31]

[30] The joint distribution is recomputed by using finer intervals for local minutes. Table 12 of the 1998 affidavit initially has intervals of 100 minutes; for the present analysis, I reduced those to intervals of 10 minutes. 100-115 O&I minutes are taken to correspond to 50-60 outgoing minutes.

[31] This point is doubly significant in light of the Shapiro-Hayes "finding" that "... fewer than one-half of 1 percent of BellSouth's wireline customers in New Orleans currently have a calling pattern and use of vertical services that could be purchased more cheaply from a PCS provider." (Shapiro-Hayes, at 22, and fn. 54 therein) First, the O&I local only minutes customer segment that could benefit from PCS is at least twice as large as that estimated by Shapiro-Hayes. Second, the *overall* size of the group of potential switchers is even larger than that because of the *other* customers with usage profiles that, according to the loci of domination, could find PCS to be cheaper.

E. The "Average Consumer's" Usage Profile Is Irrelevant for Estimating the Switching Probability

27. In trying to dramatize their "finding" that the wireline residential customer segment that would find PCS cheaper is inconsequentially small, Shapiro-Hayes claim that "… the *average consumer in New Orleans uses over 2000 minutes of local and intraLATA calling each month* and spends *at least 94 minutes* on the phone on local calls for every *one* she spends on an intraLATA call …" (Shapiro-Hayes, at 22-23; emphasis in original). This claim is based on their observation that the average *outgoing* local minutes of use in New Orleans is 1060 per month and the average *outgoing* intraLATA toll minutes of use is 11 per month (both averages taken from Table 6 of my 1998 affidavit). Based on assumed reciprocity in telephone calling, they double these average minutes to arrive at average O&I local and intraLATA toll minutes.

28. While that observation is correct so far as it goes (even though, in light of the highly skewed usage distributions, the *median* is a far better measure of an average than the *arithmetic mean* that Shapiro-Hayes cite),[32] Shapiro-Hayes repeat an error first committed by Professor Shapiro in his comments on my *1997* affidavit:[33] they characterize these minutes as being those of the "average consumer in New Orleans." As I discussed in detail in my 1998 affidavit, such a characterization would only be correct if the respective distributions across customers of local and intraLATA toll minutes were statistically *independent*.[34] In my 1998 affidavit, I specifically tested for this property in the joint distribution of minutes presented in Table 12 and concluded that statistical independence could not be confirmed. Neither Shapiro-Hayes nor Hubbard-Lehr question this point. Hence, a simple usage profile for the so-called average customer cannot be constructed. Instead, only conditional means for local and intraLATA toll usage can be calculated, as in Table 13 of the 1998 affidavit.

29. Without belaboring this statistical fact, the point Shapiro-Hayes attempt to make by reference to the so-called average consumer is that those averages are so far above the range of

[32] Median minutes of use are also reported in Table 6 of my 1998 affidavit.

[33] Declaration of Carl Shapiro, on behalf of Sprint, CC Docket 97-231, November 25, 1997.

[34] 1998 affidavit, at 18.

local and intraLATA toll usage at which PCS is putatively cheaper that the "... calling and purchasing patterns underlying the NERA study are surely very rare."[35] The thrust of this argument, as it turns out, is completely beside the point. First, the identifiable customer group of potential switchers most definitely does *not* share the usage profile of the so-called average customer in New Orleans, not even remotely so. I had stated repeatedly in my 1998 affidavit that the customer segment most likely to switch to PCS is characterized by "relatively low to moderate usage."[36] Second, while knowledge of the average minutes of use may help to provide some perspective, the only relevant quest here is for the size of the group of likely switchers—no matter how extreme their usage profile. The adjusted version of Table 14 (see above) reports the size of that group for each of four PCS plans.

F. The Cost of InterLATA Toll Calls Should *Not* be Included in the Wireline-PCS Price Comparisons

30. Shapiro-Hayes criticize my exclusion of *inter*LATA minutes from the price comparisons I made to determine the switching probabilities. They contend that PCS providers in Louisiana assess both regular long distance charges and airtime fees for interLATA calls, whereas wireline users of interLATA service pay no additional fees beyond long distance charges. (Shapiro-Hayes, at 18) Therefore, they conclude that exclusion of interLATA minutes in my price comparisons was an omission of an important, asymmetric source of cost to the PCS customer. To underscore the supposed seriousness of this omission, Shapiro-Hayes point out that "the average Louisiana customer makes 230 minutes of interstate interLATA calls per month ..." (Shapiro-Hayes, at 18)

31. I disagree with this Shapiro-Hayes criticism for several reasons. To start with, there are obvious data problems. Shapiro-Hayes' attribution of 230 minutes of monthly interLATA minutes to the "average Louisiana customer" suffers from the same maladies as their profile of the average customer based on local and intraLATA toll minutes alone. In addition, although it is hard to gauge the full significance of this, the 230 minutes appear to be estimated by dividing

[35] Shapiro-Hayes, at 23.

[36] 1998 affidavit, at 1 and 21-23.

the total number of 1995 interstate dial equipment minutes in the *entire* state of Louisiana (not just for BellSouth customers or only in the New Orleans major metro area) by the 1995 total number of presubscribed lines in Louisiana (again, not just for BellSouth customers or only in the New Orleans major metro area).[37] This creates an obvious mismatch between my data and theirs. Furthermore, the Shapiro-Hayes estimate of average interstate *inter*LATA minutes appears to be biased upward because the interstate dial equipment minutes (on which they are based) also include both interstate *intra*LATA minutes and the domestic portion of international calls.[38] More importantly, however, Shapiro-Hayes simply do not carry their analysis far enough and, therefore, fail to recognize certain realities that are germane here.

32. First, long distance charges only apply to PCS calls that cross designated coverage area boundaries of PCS providers, not LATA boundaries for wireline carriers like BellSouth. Those coverage areas are frequently larger than areas within which wireline calls would be considered either local or intraLATA toll. Therefore, many calls that for a wireline customer would be rated as *inter*LATA toll (to which separate long distance charges would apply) could qualify as calls *within* the coverage area for a PCS customer and would, therefore, be exempted from long distance charges (i.e., would pay only standard airtime charges).[39] For those calls, the PCS customer would be spared long distance charges, making PCS *even more attractive* relative to wireline. Furthermore, the introduction of PCS calling plans, e.g., Sprint PCS' Home Rate USA and Toll-Free USA and PrimeCo's state-wide toll-free calling (and, outside Louisiana, AT&T's Digital One Rate Service plan and Powertel's low-price plans for calling within a 12-state region) all make it easier for a customer to turn calls hitherto treated as interLATA long distance wireline calls into PCS calls that qualify for zero or greatly reduced long distance

[37] Although Shapiro-Hayes provide no explanation for this estimate, Professor Shapiro had reported the same estimate in Appendix B of his comments on my 1997 affidavit. I assume Shapiro-Hayes are relying on the same source, namely, the FCC Monitoring Report, 1997, Tables 4.15-4.19.

[38] FCC Monitoring Report, 1997, at 315.

[39] For example, New Orleans and Baton Rouge fall within the same PrimeCo coverage area. PCS calls between those cities would be charged standard airtime rates even though, to a wireline carrier, calls between those cities would be interLATA toll calls.